

REMARKS

Claims 5-13 stand rejected under 35 USC 102(e) as anticipated by and in the alternative obvious over Jensen et al '121. In addition, claim 4 is rejected under Jensen et al under 35 USC §103(a).

With respect to claims 5-13, Applicant respectfully submits that the cited reference fails to anticipate Applicant's claimed invention. Applicant's claims 5-13 are specifically directed to a process in which the complex hydride and the dopant are kept under pressure in the presence of hydrogen gas while increasing the temperature under pressure. The cited Jensen et al '121 reference as set forth in paragraph 0039 merely uses heat to mix the reagents together. In contrast, Applicant's claimed invention uses a combination of heat, pressure, and hydrogen gas to achieve a molten state which allows for the formation of new compositions not possible by simple heating. As stated on page 7, line 9, of the specification, it is believed that the improved properties of the resulting fused hydrogen storage material are attributable to the high mobility of atoms which occurs as or near the melting state of the complex hydride. As a result of the mobility, an enhanced intermixing may occur which results in a more homogeneous product and does not require the use of solvents or other reactants that can impair the resulting hydrogen storage properties of the resulting fused material. The improvements noted in hydrogen storage capabilities and hydrogen storage kinetics is consistent with the belief that the chemical reaction and ion exchange which occurs during the elevated temperature, pressure, and hydrogen parameters results in novel compounds which cannot be achieved by conventional ball milling or the use of elevated temperatures alone. Heating alone does not achieve the properties of Applicant's claimed composition.

It is inherent in the Jensen et al '121 reference that pressure is not applied to the heated mixture since one of the purposes of the heating is to "drive off the cyclopentadienyl component of the mixture." (Paragraph 0039 of Jensen '121) Pressure would have prevented any components from being driven off or released as is stated in Jensen. In addition, there is no mention at all of any pressure much less using hydrogen gas for the pressure. Further, to the extent Jensen et al '121 in paragraph 0039 states that heating can occur for as little as five minutes, such teaching is directly opposite the statements by the Examiner that it would be *prima facie* obvious to heat

under pressure to increase the rate of fusion. In addition, the reference is silent as to using hydrogen gas as the gas used to achieve pressure.

Applicant respectfully submits that it is well recognized in the art that materials exhibit different physical and chemical properties when heated/melted as opposed to heated/melted under pressure. In addition, since the materials or hydrogen storage property, using hydrogen gas to maintain the pressure alters the characteristics of the molten material that are not otherwise achieve when melted in the absence of pressure under hydrogen gas. Accordingly, it is respectfully submitted that the claims are not anticipated by the Jensen et al '121 reference.

As set forth on page 9 of the specification beginning with line 26, Applicant's data indicates that the resulting fused product is not the simple blending of melted starting materials. As indicated from the x-ray diffraction patterns, the reactants result in a fused hydrogen storage material as a result of a chemical reaction that does not occur by the simple melting of the reagent materials together. The addition of heat and elevated pressure, in the presence of hydrogen gas, results in the formation of novel materials not obtained by simple melting of the reagents. As indicated by the data, the novel fused hydrogen storage materials exhibit hydrogen release kinetics as well as desirable rehydrogenation properties and cyclability that are improvements over hydrogen storage materials prepared by conventional ball milling or wet doping techniques.

Further, applicant respectfully submits that Jensen et al '121 fails to establish a *prima facie* case of obviousness with respect to claim 4 and claims 5-13. There is no teaching or suggestion in the reference of using hydrogen gas as part of the reaction process. Likewise, there is no teaching or suggestion to use pressure in combination with the heating step. Rather, Jensen et al '121 as set forth in paragraph 0039 actually teaches away the use of pressure since a stated purpose of the heating process is to "drive off" a volatile product that could not otherwise occur if heated under pressure.

Accordingly, Applicant respectfully submits that claims are patentably distinct over the Jensen et al '121 reference of record.

Claims 11-13 stand rejected under 35 USC §102(a) as being anticipated by Jensen et al '935 or obvious over Jensen et al '935. Claims 11-13 also stand rejected

under 35 USC §102(e) as anticipated by, or in the alternative, under 35 USC §103(a) as obvious over Gross et al '909.

Applicant respectfully submits that neither Jensen et al '935 or Gross et al '909 either anticipates or establishes a *prima facie* case of obviousness over the claimed subject matter. As amended, claims 11 through 13 are directed to the hydrogen storage material made according to the process of respective claims 4, 5, and 9. Either directly or indirectly the claims require the combination of heat and pressure in the presence of hydrogen gas such that the reactants form a fused material. In contrast, both the Jensen et al '935 and the Gross et al '909 are directed to a dry doping method using a mechanical milling process. While the ball milling process is done under hydrogen pressure, the temperatures employed as disclosed in the respective references are well below the melting point of the respective reactants. Accordingly, absent any teaching or suggestion of the use of melting point temperatures, pressure conditions, and in the presence of hydrogen gas, the references fail to anticipate or render obvious Applicant's claimed subject matter in claims 11 through 13.

Claims 4-13 stand rejected under 35 USC 112 second paragraph as being indefinite. By way of the above amendment to the claims, Applicant has addressed the claim language noted by the Examiner. The assistance of the Examiner on these points is gratefully acknowledged.

Inasmuch as all outstanding issues raised by the Examiner have been addressed, it is respectfully submitted that the present application is in condition for allowance, and action to such effect is earnestly solicited. The Examiner is encouraged to telephone the undersigned at his/her convenience should only minor issues remain after consideration of the present Amendment, to permit early resolution of same.

Please charge any additional fees required by this Amendment to Deposit
Account No. 50-3172.

Respectfully submitted,

J. BENNETT MULLINAX, LLC



J. Bennett Mullinax
Reg. No. 36,221